WASHINGTON AGRICULTURAL CHEMICAL USAGE
2004 Vegetables Summary
August 2005

NATIONAL AGRICULTURAL STATISTICS SERVICE

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CHEMICAL USAGE OVERVIEW

Vegetable chemical usage data for selected Washington vegetable crops are presented in the accompanying releases. These data are the results of the Vegetable Chemical Usage Survey that was conducted in the fall of 2004. This survey was designed to collect data on pesticides applied to selected vegetable crops in 2004. A sampling of producers in major vegetable growing states, across the United States, was chosen to establish the estimation base. The probability nature of the survey allowed for estimates that are representative of chemical use on all targeted vegetables in each of the participating states. Survey results include estimates of the percent of area treated, number of applications, rates per application, rates per crop year, and total pounds of chemical applied. Data are summarized for the active ingredients of pesticides and other chemicals applied. Pesticide data were collected for specific formulations of trade name products and then converted to active ingredients. Therefore, the estimates associated with a particular active ingredient may represent applications of several trade name products. Pesticide application rates also reflect partial coverage applications as a result of band, spot, and alternate row spraying techniques. This survey excludes any chemical treatments applied to the vegetables after harvest. Data on fertilizer applications were collected during the 2002 Vegetable Chemical Usage Survey, but were not collected in 2004.

Targeted crops in Washington included asparagus, processing carrots, processing sweet corn, bulb onions, and processing green peas. Chemical use releases for all five crops surveyed in Washington, and crops surveyed in other states, are available upon request or via the internet. Thanks are given to the many Washington vegetable producers and contractors who provided the information summarized in these reports. Detailed reports, such as these, would not be possible without their voluntary cooperation.

Terms and Definitions

Active ingredient is the specific chemical which kills or controls the target pests. Usage data are reported by pesticide product and are converted to an amount of active ingredient. A single method of conversion has been chosen for active ingredients having more than one way of being converted. For example in this report, copper compounds are expressed in their metallic copper equivalent, and others such as 2,4-D and glyphosate are expressed in their acid equivalent.

Agricultural chemicals refer to the active ingredients in fertilizers and pesticides. **Pesticides** include any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pests targeted by pesticides include weeds, insects, fungi, and other forms of life.

> **Herbicides**--weeds**, insecticides**--insects**, fungicides**--fungi, **and other chemicals** --other forms of life, make up the four classes of pesticides presented in this report. Miticides and nematicides are included as insecticides, while soil fumigants, growth regulators, defoliants, and desiccants are included as other chemicals. This report excludes pesticides used for seed treatments, for spot treatment, and for postharvest applications to the commodity.

Crop year refers to the period immediately following harvest for the previous crop through harvest of the current crop. **Application rates** refer to the average number of pounds of a fertilizer primary nutrient or pesticide active ingredient applied to an acre of land in one application. The rate reflects the effect of band, spot, or alternate row middle spraying. **Rate per crop year** is the average number of pounds applied of an ingredient to one acre of land over the entire crop year, counting multiple applications. **Number of applications** is the average number of times a treated acre receives a specific agricultural chemical. **Area applied** represents the percentage of crop acres receiving one or more applications of a specific agricultural chemical. **Avoidance** may be practiced when pest populations exist in a field or site but the impact of the pest on the crop can be avoided through some cultural practice, such as choosing cultivars with genetic resistance to pests or using trap crops. This report does not contain **acre treatments**. However, acre treatments can be calculated by multiplying the acres planted by the percent of area applied and the average number of applications.

Trade name is the trademark name given to a specific formulation of a pesticide product. A formulation contains a specific concentration of the active ingredient, carrier materials, and other ingredients such as emulsifiers and wetting agents. Some formulations as in the case of pre-mixes, can contain more than one active ingredient. The **common name** is an officially recognized name for an active ingredient. This report shows active ingredient by common name.

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TRADE NAMES, COMMON NAMES, AND CLASSES

The following is a list showing common name, associated class, and trade name of active ingredients in this publication. The classes are herbicides (H), insecticides (I), fungicides (F), and other chemicals (O). This list is provided as an aid in reviewing pesticide data. Pre-mixes are not cataloged. The list is not complete for all pesticides used on the vegetable crops surveyed and NASS does not mean to imply use of any specific trade name.

Class	Common Name	Trade Name
H	2, 4-D	Amine 4, Class LV4, Curtail (EC), Formula 40, Riverside LV4, Salvo
H	Aciflourfen, sodium salt	Conclude Xtra B&G, Manifest B&G
H	Alachlor	Arrow, Bronco, Bullet, Confidence, Intrro, Judge, Lariat, Lasso, Lasso II, Micro-Tech, Partner, Saddle 4EC/Alachlor 4EC, Stall
O	Aminopyridine	Avitrol Corn Chops
H	Atrazine	AAatrex 4L, AAatrex Nine-O (WP), Atrazine 4L, Atrazine 5L, Atrazine 80 (WP), Atrazine 90DF, Basis Gold WDG, Bicep II, Bicep II Magnum, Bicep Lite II, Bicep Lite II Magnum, Bullet, Cinch ATZ, Conquest, Degree Xtra, Drexel, Trizmet II, Extrazine II, G-Max Lite, Guardsman Herbicide, Harness Xtra, Keystone, Laddok, Lariat, Lumax, Prozine
I	Azadirachtin	Agroneem, AZA-Direct, Ecozine, Margosan-O, Botanical Insecticide, Neemix, Ornazin, SuperNeem
I	Azinphos-methyl	Azinphos, Guthion
F	Azoxystrobin	Amistar, Quadris (aka Abound), Quilt
I	Bt (Bacillus thuringiensis)	Agree, Biobit, Bt 320 Dust, Condor, Crymax, Deliver, Dipel, Javelin, Ketch, Lepinox, MVP II Bioinsecticide, Prolong, Thuricide HPC, Xentari
H	Bensulide	Prefar
H	Bentazon	Basagran, Conclude Xtra, Laddok, Manifest, Pledge
I	Bifenthrin	Brigade, Capture, Discipline, Empower
H	Bromoxynil	Buctril, Moxy Weed Killer
I	Carbaryl	Sevin
H	Carfentrasone-ethyl	Affinity, Aim, Avalanch Aim
O	Chloropicrin	Chlor-o-pic, InLine, Methyl Bromide, Telone, Tri-Color, Tri-con
F	Chlorothalonil	Bravo, Chlorothalonil 4L Plus Zinc, Concorde, Daconil, Echo, Ensign, Equus, Flouronil, PathGuard, Ridomil, Tilt/Bravo
I	Chlorpyrifos	Aqua-sect, Chlorpyrifos, Govern, Lorsban, Nufos
H	Clethodim	Arrow, Conclude, Prism, Select, Volunteer
H	Clomazone	Command, Strategy
F	Copper ammonium complex	Copper-Count-N
F	Copper hydroxide	Blue Shield, Champ, Champion, Coppercide, Kocide, Mankocide, Nu-Cop, Ridomil
F	Copper resinate	Camelot, Tenn-Cop
H	Cyanazine	Bladex, Conquest, Cy-Pro, Extrazine
I	Cyfluthrin	Aztec, Bayer Adv. Garden Powerforce, Baythroid, Renounce
I	Cypermethrin	Ammo, Battery
H	DCPA	Dacthal
I	Diazinon	D- 264, Diazinon, D-z-n Diazinon
H	Dicamba	Banvel, Clarity
O	Dichoropropene	InLine, Telone
F	Dicloran	Botran, Sclerban
H	Dimethenamid	Frontier, Guardsman
H	Dimethenamid-P	G-Max, Guardsman, Outlook
I	Dimethoate	Cygon, Cymate, Dimate, Dimethoate
I	Disulfoton	Di-syston
N	Diuron	Direx, Diurin, Karmax
H	EPTC	Eptam, Eradicane
I	Esfenvalerate	Asana, Curbit, Ortho Bug-B-Gon, Sonalan, Strategy
H	Fluazifop-p-butyl	Fusilade
H	Fluroxypyr	Starane
O	Gramma aminobutyric acid	Auxigro
H	Glyphosate iso. salt	Bronco, Buccaneer, Clear-out, Cornerstone, Credit, Engame, Eraser, Fire Power, Gly Star, Glyfos X-TRA, Glyphomax, Glyphosate, Helosate Plus, Honcho, Mirage, Ranger, Roundup, Supersate
H	Halosulfuron	Permit, Sandea
H	Imazamox	Raptor

TRADE NAMES, COMMON NAMES, AND CLASSES (continued)

CLASS	COMMON NAME	TRADE NAME
H	Imazethapyr	Pursuit
F	Iprodione	Iprodione, Rovral
O	L-Glutamic acid	Auxigro
I	Lambda-cyhalothrin	Karate, Warrior
H	Linuron	Linex, Lorox
H	MCPA	Chiptox, MCP Amine, Rhomene, Rhonox, Weedar
H	MCPA, dimethylamine salt	MCPA Amine
I	Malathion	Cythion, Fyfanon, Malathion
O	Maleic hydrazide	Maleic, Royal, Sprout
F	Mancozeb	Acrobat, Curzate, Dithane, Gavel, Mancozeb, Manex II, Mankocide, Manzate, Penncozeb, Ridomil
F	Maneb	Amazin, Maneb, Manex
F	Mefenoxam	Flourish Ultra, Flouronil, Ridomil
F	Metalaxyl	Ridomil
O	Metan-sodium	Metam, Sectagon, Vapam
I	Methomyl	Lannate
I	Methyl parathion	Declare, Methyl Parathion, Parathion-Methyl Parathion, Penncap-M, Super Ten
H	Metolachlor	Becep II, Drexel Trizmet II, Dual, Me-Too-Lachlor
H	Metribuzin	Lexone, Sencor
H	Nicosulfuron	Accent, Basis Gold
H	Norflurazon	Solicam
I	Oxamyl	Vydate
I	Oxydemeton-methyl	Metaasystox-R
H	Oxyfluorfen	Fire Power, Goal
H	Paraquat	Gramoxone, Starfire
H	Pendimethalin	Pendimax, Prowl, Prozine, Pursuit
I	Permethrin	Ambush, Arctic, Perm-Up, Permethrin, Pounce
I	Petroleum distillate	JMS Stylet-Oil, Oil, Saf-T-Side, Sunspray Ultra-Fine-Oil, Supreme Spray
F	Propiconazole	Bumper, Quilt, PropiMax, Tilt
F	Pyraclostrobin	Cabrio, Headline, Pristine
H	Quizalofop-P-ethyl	Assure
H	S-Metolachlor	Bicep, Cinch, Dual Magnum, Lumax
H	Sethoxydim	BASF Poast, Manifest, Poast, Rezult G
H	Simazine	Princep Caliber, Sim-Trol, Simazine
F	Sulfur	Alfa, Ben-Sul, Bravo, Golden-Dew, Kolodust, Kumulus, Microsperse, Microthiol, Suffa, Sulfur, Super Six, Thiolux
F	Tebuconazole	Folicur
I	Tebupirimphos	Aztec
I	Tefluthrin	Force
H	Terbacil	Sinbar
H	Triallate	Far-Go
H	Trifluralin	Preen, Treflan, Tri-4, Trifluralin, Trilin, Trust
I	Zeta-cypermethrin	Fury, Mustang

All Vegetables: Pest Management Practices, Washington and Program States, 2004

Practices	WA	Program States	WA	Program States
	Percent of Acres Receiving		Percent of Farms Utilizing	
Prevention Practices:				
No-till/minimum till used	9	22	18	21
Remove or plow down crop residue	68	73	53	66
Clean implements after fieldwork	65	67	60	56
Field cultivated for weed control	84	82	75	73
Field edges/etc. chopped, mowed/etc.	86	82	76	69
Water management practices	62	44	40	24
Avoidance Practices:				
Adjust planting/harvesting dates	27	30	13	20
Rotate crops to control pests	83	85	63	78
Planting locations planned to avoid pests	35	43	24	37
Grow trap crop to control pests	2	4	4	5
Crop variety chosen for pest resistance	43	46	32	38
Monitoring Practices:				
Scouting by general observation	80	85	70	67
Deliberate scouting activities	14	13	25	27
Field was not scouted	6	1	5	6
Established scouting process/insect trap used	64	64	45	35
Scouting due to pest advisory warning	20	25	10	15
Scouting due to pest development model	24	29	15	17
Scouted for weeds	98	94	93	89
Scouting for weeds was done by:				
Operator, partner, or family member	48	43	60	73
An employee	13	11	6	3
Farm supply or chemical dealer	21	13	22	7
Indep. crop consultant or comm. scout	18	33	12	17
Scouted for insects and mites	98	99	94	92
Scouting for insects/mites was done by:				
Operator, partner, or family member	43	31	54	65
An employee	14	9	7	3
Farm supply or chemical dealer	21	16	23	8
Indep. crop consultant or comm. scout	22	44	16	24
Scouted for diseases	95	97	89	88
Scouting for diseases was done by:				
Operator, partner, or family member	47	30	58	65
An employee	11	8	5	3
Farm supply or chemical dealer	22	17	23	8
Indep. crop consultant or comm. scout	20	45	14	24
Records kept to track pests	62	63	40	36
Field mapping of weed problem	26	23	15	13
Soil/plant tissue analysis to detect pests	57	45	31	23
Weather monitoring	72	77	53	61
Biological pest controls	43	23	22	10
Suppression Practices:				
Biological pesticides	3	29	4	13
Beneficial organisms	1	9	2	6
Scouting used to make decisions	37	49	28	32
Maintain ground cover or physical barriers	44	50	38	46
Adjusted planting methods	22	26	19	23
Alternate pesticides with different MOA	67	63	37	40

* *Less than 0.5 percent.*